

What is claimed is:

1 1. An uninstall control apparatus connected with a  
2 master device and for controlling a process for  
3 uninstalling control software from the master device, the  
4 control software being used by the master device for  
5 controlling one or more slave devices in a system  
6 consisting of the master device and the one or more of slave  
7 devices, the uninstall control apparatus comprising:

8 timing means for, if one of the slave devices is  
9 disconnected from the system, measuring elapsed time since  
10 the disconnection of the disconnected slave device;

11 timing control means for controlling the timing for  
12 uninstalling control software for the disconnected slave  
13 device; and

14 uninstall means for uninstalling the control  
15 software for the disconnected slave device under the  
16 control of the timing control means, wherein

17 the timing control means controls the uninstall means  
18 to start uninstalling, if the disconnected slave device  
19 is not reconnected to the system before the measured  
20 elapsed time reaches a first predetermined time.

1 2. The uninstall control apparatus of Claim 1, wherein  
2 the disconnection/reconnection of the slave device  
3 from the system is detected by a bus reset signal generated  
4 following the disconnection/reconnection.

1 3. The uninstall control apparatus of Claim 1, wherein  
2 the uninstall process executed by the uninstall means  
3 includes a plurality of stages, and  
4 the timing control means controls the uninstall means  
5 to execute each of the plurality of stages in response to  
6 the elapsed time measured by the timing means.

1 4. The uninstall control apparatus of Claim 3 further  
2 comprising:  
3 restoration means for restoring data modified in the  
4 uninstall process, wherein  
5 the timing control means, when the reconnection of  
6 the slave device is detected before the uninstall means  
7 completes the uninstall process, stops the uninstall  
8 process by the uninstall means and gives the restoration  
9 means an instruction to restore the data modified by the  
10 time when the reconnection is detected to a state before  
11 starting of the uninstall process.

1 5. The uninstall control apparatus of Claim 4, wherein  
2 the control software to be uninstalled is described  
3 in an object-oriented language,  
4 the uninstall process executed by the uninstall means  
5 includes a stage for unloading classes which was loaded  
6 at the time when the control software was installed, and  
7 the timing control means controls the uninstall means  
8 to unload the classes when the elapsed time reaches a second

9 predetermined time.

1 6. The uninstall control apparatus of Claim 4, wherein  
2 the uninstall process executed by the uninstall means  
3 includes a stage for deleting registration information on  
4 the control software being the target for the uninstall  
5 process, the registration information being generated at  
6 the time when the control software was installed, and  
7 the timing control means controls the uninstall means  
8 to delete the registration information when the elapsed  
9 time reaches a third predetermined time.

1 7. The uninstall control apparatus as defined in any one  
2 of Claims 4 to 6 further comprising:

3 storage means for storing installed control software,  
4 wherein

5 the uninstall process executed by the uninstall means  
6 includes a stage for deleting the control software being  
7 the target for the uninstall process from the storage means,  
8 and

9 the timing control means controls the uninstall means  
10 to delete the control software from the storage means when  
11 the elapsed time reaches a fourth predetermined time.

1 8. The uninstall control apparatus of Claim 7 further  
2 comprising:

3 acquisition means for acquiring control software and

4 storing the control software in both auxiliary storage  
5 means and the storage means, wherein

6           the uninstall process executed by the uninstall means  
7 includes a stage for deleting the control software from  
8 the auxiliary storage means, and

9           the timing control means controls the uninstall means  
10   to delete the control software from the auxiliary storage  
11   means when the elapsed time reaches a fifth predetermined  
12   time.

1 9. The uninstall control apparatus of Claim 3, wherein  
2 the timing control means controls the uninstall means  
3 to execute each of the plurality of stages at a  
4 predetermined time set for the stage, wherein

5       the uninstall control apparatus further comprises:  
6       updating means for updating the first predetermined  
7       time and at least one of the predetermined times set for  
8       the plurality of stages in accordance with external  
9       designation.

1 10. The uninstall control apparatus of Claim 1 further  
2 comprising:

3           update information reception means for receiving  
4   update information on control software, wherein  
5           when the update information reception means receives  
6   update information on control software and disconnection  
7   of the slave device corresponding to the control software

8 is detected for the first time after receiving the update  
9 information, the timing control means controls the  
10 uninstall means to execute the uninstall process without  
11 controlling the process based on the elapsed time.

1 11. A method for controlling a process for uninstalling  
2 control software from a master device, the control software  
3 being used by the master device for controlling one or more  
4 slave devices in a system consisting of the master device  
5 and the one or more of slave devices, the method comprising  
6 the steps of:

7 a detection step for detecting disconnection of a  
8 slave device from the system;

9 a timing step for measuring elapsed time since  
10 disconnection of the disconnected slave device is detected  
11 in the detection step; and

12 an uninstall step for uninstalling control software  
13 for controlling the disconnected slave device, the  
14 uninstall step being started, if reconnection of the  
15 disconnected slave device is not detected before the  
16 measured elapsed time reaches a first predetermined time.

1 12. The method for controlling the uninstall process of  
2 Claim 11, wherein

3 the uninstall step includes a plurality of stages,  
4 and

5 each of the plurality of stages are executed when the

6 elapsed time reaches a predetermined time preset for the  
7 stage.

1 13. The method for controlling the uninstall process of  
2 Claim 12, further comprising:

3 a restoration step for, when reconnection of the  
4 disconnected slave device is detected during the uninstall  
5 step, stopping the uninstalling and restoring the data  
6 modified in the stages having been executed by the time  
7 when the reconnection is detected to a state before  
8 starting of the uninstalling.

1 14. A computer-readable recording medium which records a  
2 program used in an uninstall control apparatus connected  
3 with a master device and for controlling a process for  
4 uninstalling control software from the master device, the  
5 control software being used by the master device for  
6 controlling one or more slave devices in a system  
7 consisting of the master device and the one or more of slave  
8 devices, the program comprising:

9 a detection step for detecting disconnection of a  
10 slave device from the system;

11 a timing step for measuring elapsed time since  
12 disconnection of the disconnected slave device is detected  
13 in the detection step; and

14 an uninstall step for uninstalling control software  
15 for controlling the disconnected slave device, the

16 uninstall step being started, if reconnection of the  
17 disconnected slave device is not detected before the  
18 measured elapsed time reaches a first predetermined time.

1 15. The computer-readable recording medium of Claim 14,  
2 wherein  
3 the uninstall step includes a plurality of stages,  
4 and  
5 each of the plurality of stages are executed when the  
6 elapsed time reaches a predetermined time preset for the  
7 stage.

1 16. The computer-readable recording medium of Claim 15,  
2 the program recorded on the recording medium further  
3 comprising:  
4 a restoration step for, when reconnection of the  
5 disconnected slave device is detected during the uninstall  
6 step, stopping the uninstalling and restoring the data  
7 modified in the stages having been executed by the time  
8 when the reconnection is detected to a state before  
9 starting of the uninstalling.